

REMARKS

Claims 55 and 61 are amended. Claims 1-3 and 45-74 are pending in the application.

Claims 1-3 and 45-54 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kawazoe, U.S. Patent No. 5,826,456; Dunlop, U.S. Patent No. 5,590,389; Kobayashi, U.S. Patent No. 5,722,165 and "Heat Treating of Aluminum Alloys", or in the case of claims 50 and 53 over this combination in further view of Drauglis, U.S. Patent No. 4,374,717. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. In order to establish a *prima facie* case of obviousness, the burden of which is placed upon the patent office, each of these three factors must be shown. Claims 1-3 and 45-54 are allowable over the cited combinations of Kawazoe, Dunlop, Kobayashi, "Heat Treatment" and Drauglis for at least the reason that the references, individually or combined, fail to disclose or suggest each and every limitation in any of those claims and fail to provide a basis for a reasonable expectation of success of achieving the invention claimed when the claims are properly considered as a whole.

Independent claim 1 recites a sputtering target having a substantially homogenous composition at any location, having a substantial absence of pores, voids, inclusions and other casting defects, having an absence of detectable precipitates, having an average grain size of less than 1 micron and having substantially uniform structure and texture at any location. The difficulty in achieving the target claimed in claim 1 is discussed in

applicant's specification at, for example, page 5, line 26 through page 7, line 15. Further, as explained throughout applicant's specification, numerous factors contribute toward and affect the mechanical, structural and compositional properties of the sputtering target of the invention. As further discussed throughout applicant's specification, the combination of features recited in claim 1 is achieved through utilization of complex and precise methodology. The complexity of the invention claimed is further evidenced by the number of references in the combination relied upon by the Examiner for the present rejection.

As indicated at page 2 of the present Action Kawazoe is relied on as showing a cast aluminum alloy material having a small grain size. As further indicated by the Examiner at page 2 of the present Action, Kawazoe does not disclose or suggest a sputtering target, a substantially homogenous composition, a substantial absence of casting defects, an absence of detectible precipitates, or a substantially uniform structure and texture. As indicated at page 3 of the present Action, Dunlop is relied upon as showing utilization of ECAE in formation of a target, Kobayashi is relied upon as showing hot forging of a cast material, and "Heat Treating" is relied upon as showing application of a solutionizing step to an aluminum alloy. The present Action addresses each of the three secondary references independently, alleging a rational for independently combining one of Dunlop, Kobayashi or "Heat Treating of Aluminum Alloys", with Kawazoe for suggesting individual elements recited in claim 1. However, applicant notes that the claims must be considered as a whole and the combination of references must suggest the combination of recited elements. There is no suggestion shown for the combination of elements recited in claim 1.

There must also be a motivation shown for the combination of all the relied upon references cited in combination for as the basis of the rejection. No motivation for combination of all four of the cited references relied upon by the Examiner is provided by

the references. Further, such motivation is not apparent from the reasoning set forth by the Examiner in the present Action.

In addition to lacking motivation for the combination of references, a basis for a reasonable expectation of success has not been established. Nothing in any of the cited references, individually or as combined, suggests that a combination of all four of the references could possibly achieve, without undo experimentation, the claim 1 recited combination of characteristics. When independent claim 1 is properly considered as a whole, the cited combination of references does not teach or suggest all of the combined characteristics recited in claim 1. No motivation for such combination or basis for a reasonable expectation of success has been shown to exist. Accordingly, a *prima facie* case of obviousness has not been established with respect to claim 1.

As indicated at page 5 of the present Action, Drauglis is relied upon as showing sputtering targets comprising nickel or silver. As combined with Kawazoe, Dunlop, Kobayashi and "Heat Treating", Drauglis contributes nothing toward suggesting the claim 1 recited combination of characteristics comprised by a sputtering target. Nor does Drauglis contribute toward providing a motivation for combining the relied upon references or contribute toward providing a basis for a reasonable expectation of success. Accordingly, independent claim 1 is not rendered obvious by the combination of Kawazoe, Dunlop, Kobayashi and "Heat Treatment" as further combined with Drauglis.

Dependent claims 2-3 and 45-54 are allowable over the cited combinations of Kawazoe, Dunlop, Kobayashi, "Heat Treatment" and Drauglis for at least the reason that they depend from allowable base claim 1.

Claims 55-60 and 73-74 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawazoe, Dunlop, Kobayashi and "Heat Treatment". As amended,

independent claim 55 recites a sputtering target having a substantial absence of pores, voids and inclusions, having an average grain size of less than about 1 micron, having a yield strength of greater than 50 mega Pascal (MP) with an ultimate tensile strength of greater than 125 MP, the target having an annealed upper surface portion and a remaining portion that is un-annealed. The amendment to claim 55 is supported by the specification at, for example, page 9, lines 9-28. The cited combination of references, individually or as combined, do not disclose or suggest the claim 55 recited target having an annealed upper surface portion and a remaining portion that is un-annealed. Additionally, there is no indication of any motivation for combining the four references relied upon by the Examiner for the present rejection. Further, no basis for a reasonable expectation of success for achieving the claim 55 recited combination of elements has been established. Independent claim 55 is therefore not rendered obvious by the cited combination of Kawazoe, Dunlop, Kobayashi and "Heat Treatment".

Dependent claims 56-60 and 73-74 are allowable over the cited combination of Kawazoe, Dunlop, Kobayashi and "Heat Treatment" for at least the reason that they depend from allowable base claim 55.

Claims 61-65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the cited combination of Kobayashi, Dunlop, Kawazoe and "Heat Treatment" as further combined with one of Takahashi, EP 0.882,813; Siewart, U.S. Patent No. 4,466,940 or Nalepka, U.S. Patent No. 4,883,721. Independent claim 61 is amended for clarification purposes. Independent claim 61 recites a copper sputtering target having characteristics including a substantially homogenous composition at any location, a substantial absence of pores, voids, inclusions and other casting defects, and absence of detectable precipitates, an average grain size of less than about 1 micron, and a substantially uniform structure

and texture at any location. Independent claim 61 is not rendered obvious by the combination of Kawazoe, Dunlop, Kobayashi and "Heat Treatment" for reasons similar to those discussed above with respect to independent claim 1.

As indicated by the Examiner at page 6 of the present Action, Takahashi is relied upon as showing a target that comprises copper. As indicated at page 7 of the present Action, Kawazoe is relied upon as showing a copper target containing gold and aluminum. As indicated at page 8 of the present Action, Nalepka is relied upon as showing a target comprising a copper silver alloy. Not one of Nalepka, Siewart and Takahashi contribute toward suggesting the recited combination of characteristics, contribute toward providing motivation for the relied upon combination or contribute toward providing a basis for a reasonable expectation of success. Accordingly, independent claim 61 is not rendered obvious by the cited combinations of Kawazoe, Dunlop, Kobayashi, "Heat Treatment", Takahashi, Siewart and Nalepka and is allowable over these references.

Dependent claims 62-65 are allowable over the cited combinations of Kawazoe, Dunlop, Kobayashi, "Heat Treatment", Takahashi, Siewart and Nalepka for at least the reason that they depend from allowable base claim 61.

Claims 66-72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kawazoe, Dunlop, Kobayashi, and "Heat Treatment", as further combined with Takahashi. Independent claim 66 recites a sputtering target formed from a cast copper material and having characteristics including a yield strength of greater than 50 MP, an ultimate tensile strength of greater than 125 MP, a substantial absence of pores, voids and inclusions and an average grain size of less than about 1 micron. The arguments set forth above regarding independent claim 1 with respect to the combination of Kawazoe, Dunlop, Kobayashi and "Heat Treatment" apply equally to independent claim

66. Takahashi does not contribute toward suggesting the combination of characteristics recites in claim 66 when the claim is properly considered as a whole. Further, Takahashi does not contribute toward motivating the combination of five references relied upon by the Examiner or contribute toward providing a reasonable expectation of success for achieving the claimed sputtering target having the claim 66 recited combination of characteristics. Accordingly, independent claim 66 is not rendered obvious by the cited combination of Kawazoe, Dunlop, Kobayashi, "Heat Treatment" and Takahashi, and is allowable over these references.

Dependent claims 67-72 are allowable over the cited combination of Kawazoe, Dunlop, Kobayashi, "Heat Treatment" and Takahashi for at least the reason that they depend from allowable base claim 66.

For the reasons discussed above, pending claims 1-3 and 45-74 are allowable. Accordingly, applicant respectfully requests formal allowance of such pending claims in the Examiner's next action.

Respectfully submitted,

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